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– Marvin Dixon,
*Director of engineering
at Four Seasons Hotel
Philadelphia*

Four Seasons Hotel Philadelphia is no stranger to providing excellence in the Philadelphia hotel industry. Located at One Logan Square on the Benjamin Franklin Parkway, Four Seasons Hotel Philadelphia provides guests with an opportunity to unwind and refresh at its luxury spa, go for a swim in its indoor 45-foot pool, savor gourmet food, and take advantage of special services offered for children, including milk and cookies at bedtime.

Recognizing Four Seasons Hotel Philadelphia's dedication to providing the highest quality of service to its guests, it's no surprise this world-renowned hotel is the first business in Philadelphia to install microturbines — a project that is expected to reduce the hotel's annual energy costs by 30 percent.

Three 65kW natural gas fired microturbines use combined heat and power (CHP) technology, enabling the hotel to generate its own electricity and heat. Philadelphia Gas Works (PGW) installed a 2-inch high pressure service with 5 psi to supply the compressors that will increase the pressure to the 75 psi needed for the microturbines to operate. The microturbines provide 100 percent of the building's day-to-day domestic hot water, 25 percent of its electric and 15 percent of its heating needs.

The microturbines are similar to a miniature jet engine contained in a case the size of a commercial refrigerator. Because the units are small they fit nicely in a space about 400 sq. ft. on the roof of the hotel. They generate electric power and useable exhaust heat providing hot water for various applications including an absorption chiller for air-conditioning.

Microturbines are also an environmentally-friendly option. When compared to traditional sources of energy for electricity and heating, they provide an enormous reduction in NO_x emissions and significantly reduce CO₂ emissions. Producing electricity on-site is much more efficient than buying it off of the grid.

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It makes sense that Four Seasons Hotel Philadelphia is a pioneer of using clean and efficient technology. Hotels are huge consumers of energy for cooking, heating, laundry, showers and swimming pools. Before installing the microturbines, Four Seasons Hotel Philadelphia relied heavily on the city's steam loop and the electric grid to meet its energy needs. Now the hotel has the opportunity to take control of a good portion of its own energy production and cost.

"We're able to budget and forecast our energy consumption by using natural gas, because we can lock in our rates," said Marvin Dixon, director of engineering at Four Seasons Hotel Philadelphia. "We're buying third party transportation gas, so we're able to shop around for the best rate."

Before deciding to install microturbines to meet the cogeneration needs of the 364-room hotel, Dixon did his homework. He examined a piece of cogeneration equipment at a local apartment complex, but soon discovered that it wouldn't work for him because its reciprocating engine had too many moving parts. That's when the idea of microturbines entered the picture. Microturbines have essentially one moving part, which drastically decreases maintenance costs. Additionally, the microturbine engine is expected to last at least twice as long as a reciprocating engine.

As soon as Dixon discovered savings in maintenance costs, he focused on his second major concern — noise.

"In a luxury hotel, noise or vibrations are not acceptable," Dixon said. "While we strive to operate as efficiently as possible, the comfort of our customers is always our number one priority."

So, in the spring of 2009, Dixon and representatives from PGW toured a microturbine installation in Elizabethtown, Pa. The noise, or lack thereof, sealed the deal for Dixon. With his encouragement, Four Seasons Hotel Philadelphia decided to move forward with the microturbine project.

In addition to the microturbine installation drastically decreasing Four Seasons Hotel Philadelphia's carbon footprint, the hotel also has a strong commitment to recycling and composting. Since 2007, the hotel has composted more than 430,000 lbs. of kitchen waste, which saved the hotel the equivalent of more than 3.5 million pounds of carbon monoxide, or the removal of 553 automobiles from the road. Some of their other green initiatives include a rooftop garden to provide food to the kitchen, using less hot water and chemicals when dealing with their laundry service, and environmentally friendly drinking water to reduce the use of plastic bottles.

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